

# 6. Fusion Science Archives (FSA)

The Fusion Science Archives was established in 2005 to learn lessons from the past fusion science archives preserved and to maintain collections of historical documents and materials that are related to fusion research in Japan. These activities are important from the viewpoint of the historical evaluation of fusion research, its social accountability and making references for seeking future directions.

Since then, historical materials on fusion research and/or organizations related to fusion research have been collected and preserved at FSA. They are stored in acid-free folders and boxes. The total number of registered items is now approximately 25,400. Most of those catalogues are available to the public through the internet in a hierarchical structure and can be accessed by the use of an electronic retrieval system.

The following collaborative works are performed this scal year along this line:

- **Studies on History of Activities of Researchers at the dawn stage of Fusion Research in Japan (NIFS17KVXV012)** T. Amemiya (CST, Nihon Univ.) *et al.*

The History of Science Group of CST, Nihon University investigated the history of fusion research in Japan from the 1950s to the 1960s. In this collaborative work, the focus is placed on the individual researchers or the organizations that have led research in the dawn of fusion in Japan utilizing the historical documents in the NIFS FSA and the KEK archives office. The subjects specically investigated in this scal year are as follows: (i) On the detailed background and the decision process for the establishment of the Institute of Plasma Physics (IPP) under the Ministry of Education. (ii) On the discussions and decisions in the Science Council of Japan for establishing the IPP.

- **Making name authority data about persons, groups, and organizations appearing in FSAD, related to fusion science in Japan (NIFS17KVXV014)** H. Gotoh (The Kyoto University Museum) *et al.*

FSA accepts various materials related to the fusion science history. It picks up essential information from materials, organizes it, and stores it in the database. The archives catalog created in such a way is provided to the users of interest. Researchers or research groups on fusion science and their mutual relations are not clear for the user only from the catalog. The purpose of this research is to clarify the method of accumulating and sorting the directories of those who have committed to fusion science. Issues found during last year and progress for resolving these issues during this year were the following: (1) Electrical database of the fusion science researcher is created by picking researchers up from the directories (as of 1961,1963 and 1971) of “KAKUYUGO (HANNOH) KONDANKAI” etc. and searched those of 1974, 1976, 1977 and 1982. (2) Those database are calibrated, modied by referring to the Overview of Japanese researcher and research subjects (1979, Kinokuniya) (3) Those database are also compared with the journal database of Nuclear Fusion and Physical Review Letters. (4) As one of the examples to identify the research group, the attributes of young researchers are searched from the directory of the Plasma Young Researcher’s Group in 1970.

- **Archival Studies on Collaborations in Heliotron Studies at Kyoto University (NIFS17KVXV015)**

T. Mizuuchi (Kyoto Univ.) *et al.*

The activity of the archives of this scal year focused on the materials related to the development of the plasma experimental devices in contrast to the FSA activity in NIFS mainly on the fusion researchers and research organization. In this regard, the archives activity are promoted on the development of the series of Heliotron devices originated from Kyoto University. The range of objects of the archives is extended to the researchers, research group, and their activity which led the Heliotron development. In these years, digitizing the minutes of research meeting from the period of Heliotron-E is progressed more than half. Although relatively new minutes are produced using word processors or personal computers and exists as electrical files, but identifying the file is sometimes difficult and some are unreadable or figures are often missing in the file. Digitizing directly from printed out documents is more efficient and continuing the digitization even relatively new one. Reserved record media are sometimes unaccessible from present day computers and started to convert such media to accessible ones.

- **History of the early days of Nuclear Fusion Research Group in Japan (NIFS17KVXV017)**

C. Namba (NIFS FSA) *et al.*

The organization “Nuclear Fusion Research Group of Japan” (KAKUYUGO KONDANKAI, hereafter referred as KK) was established in 1958. Dr. H. Yukawa was the first president of this organization. This KK continued to perform an important role in the research and development in fusion science in Japan as a voluntary organization for researchers until it became “The Japan Society of Plasma Science and Nuclear Fusion Research” in 1983. The theme of this work is to clarify the establishment process of the KK and how organized researchers and how planned to promote the fusion development research. It is newly conrmed that the KK was established before November 1957 and was formed as a researcher’s voluntary organization to promote plasma physics, but is different from “Assembly for Nuclear Fusion Reactions” (KAKUYUGO HANNOH KONDANKAI)

established under Science Technology Agency. After the establishment of the KAKUYUGO KONDANKAI, Advisory Committee on Nuclear Fusion (KAKUYUGO SENMONBUKAI) was organized in the Atomic Energy Commission of the Japanese Cabinet Office.

• **Collaborative Activities at NIFS Fusion Science Archives (NIFS FSA) (NIFS17KVXV018)**

S. Kubo (NIFS, FSA) *et al.*

The purpose of this collaboration is to arrange and promote the general archival activities under the NIFS collaboration framework. More than 50 researchers from universities and research institutions have joined this collaboration research. Nine collaboration programs were approved and performed as a NIFS general collaboration (NIFSKVXV012-022). One workshop type collaboration (NIFS19KKGV004) is approved and performed as a second Archives in Natural Science Workshop in December 2019 at NIFS. Beside those activities, the strengthening of the archive function is tried by increasing the racks for preserving the donated materials, introducing optical scanners, micro-film readers, etc.

• **Construction of Digital Library of Husimi Kodi Archives (NIFS18KVXV019)** H. Iguchi (NIFS, FSA) *et al.*

Digitizing the historical documents left by Kodi Husimi, the first director of Institute of Plasma Physics (IPPJ), Nagoya University, is continued to be covered almost 12% among registered documents. All documents in the box number B401a and b are finished the digitization. Beside of these digitization, cataloging the historical materials donated from the bereaved family of Kenzo Yamamoto is completed. He lead the fusion energy development as a professor of Nagoya University and later as a Technical Advisor of JAERI and this catalogue will be useful for investigating the expanding period of the Japanese fusion energy research.

• **Archives of the Historical Material related to the Plasma Spectroscopy (NIFS19KVXV0020)**

N. Yamaguchi (Comprehensive Research Organization for Science and Society (CROSS)) *et al.*

Workshops called “Plasma Elementary Process workshop” or “Spectroscopy workshop” have been held as a collaboration research of Institute of Plasma Physics, Nagoya University (IPP) and NIFS from 1969 to the present. The editing work of the history of the these workshops is continued from last year. The agenda and reports of each workshop are piled up as an annex of the history.

• **Investigation and Analysis of Historical Materials on Startup and Development Phase of Fusion Technology Research in Japan (NIFS17KVXV021)** S. Matsuda (Tokyo Inst. Technology) *et al.*

The startup and development phase of the fusion technology research in Japan was investigated from the view point of Japan Atomic Energy Research Institute (JAERI) and the Institute of Plasma Physics, Nagoya University (IPPJ) under the collaboration with FSA. Following the interview with Shigeru MORI last year about the origin and the background of the fusion reactor technology research in JAERI, he suggested that there had not been close relationship between those in JAERI and in IPPJ and universities. We have decided to summarize publish the historical flow of “Japanese Fusion Reactor Technology”. General items to be described are, 1. The Dawn of Japanese Fusion Reactor Technology Started in JAERI., 2. Fusion Advisory Committee and Subcommittee., 3. Fusion Technology Development under Grants-in-Aid for Scientific Research., 4. Advances in the Fusion Reactor Material Development.

• **Establishment and Evolution of the Inter-University Research Institute Cooperation System (NIFS16KVXV022)** K. Matsuoka (NIFS, FSA) *et al.*

Institute of Plasma Physics (IPPJ) of Nagoya University was established as a joint usage/research center and has functioned as a center of the plasma and fusion research in Japan, but has lost a leadership during the course of the future plan discussion in the Japanese Academic Council which began in 1982. Although the toroidal plasma confinement experiments had started in 1970's, not many academic results which are useful in the fusion energy development were achieved and IPPJ could not propose an attractive future plan.

• **Comparative Studies of Practical Issues of Archiving and Utilization of Historical Records of Scientific Activities and Academic Policy Making (NIFS19KKGV004) (NIFS19KKGV004)**

Y. Takaiwa (KEK, Archives Office) *et al.*

Archives activities of NIFS has been performed for more than ten years collaborating with some institutes of Inter-University Research Institute Corporations, Sokendai and others. During this process, the importance of understanding conceptual and practical issues in managing the archives of scientific or academic research institutes is noticed, which is not necessarily well understood by most of practitioners of archive. In this sense, the information exchange among such archives and related audiences is also important. The workshops for this purpose have been held twice a year in recent days; in 2019, one, in Tsukuba (KEK and National Museum of Nature and Science) in August, and the other, at NIFS in December. Joint proceedings of the two workshops will be published as a NIFS-memo and KEK reports.

(S. Kubo)